

Early Holocene Archaeology and Paleoecology on the Northern Northwest Coast

Recent investigations in southern Haida Gwaii (Queen Charlotte Islands) on the northern northwest coast provide evidence of coastal occupation extending to over 9,000 BP (before present) and a model for applying geological evidence to early Holocene site location. This work is part of the multidisciplinary Gwaii Haanas Archaeological Project with archaeology carried out by a team of Parks Canada, Haida and consulting archaeologists; and marine geology and paleoecology carried out by the author and marine geologists from the Geological Survey of Canada. The study area encompassed by this research includes Gwaii Haanas, an archipelago jointly managed by Parks Canada and the Haida Nation, and adjacent areas of Hecate Strait (see map, p. 46). The following is a brief synopsis of the substantive results to date. This draws from unpublished and published sources as well as work in progress. Paleoecology is key to understanding the Early Period (pre-5,000 BP) archaeological record on the Northwest Coast. Quaternary sea levels and environment have been subject to substantial change with significant repercussions to adaptation and site location.

At present, the sea level record for Haida Gwaii is the most detailed available for the outer coast of the archipelago. Recent marine and terrestrial geological and paleoecological investigations in this area show that the character of the area changes significantly during early post-glacial times. From before 13,000 until 10,500 BP the archipelago comprised a large land mass (ca. 3,000 km²) dominated by broad plains with wide shorelines. Sea level rose rapidly between 10,500 and 9,000 BP resulting in the much smaller archipelago we see today (ca. 1,500 km²). Modern Haida Gwaii is characterized by a rugged and narrow steep shoreline where the mountains slope directly to the ocean.

Paleobotanical investigations across Haida Gwaii show that lowland glaciation was over by 14 to 15 BP. Cold tundra-like conditions appear to have ensued from before 14,000 BP until ca.

12,000 BP when conifers began to re-establish. At this time, and until the rapid sea level rise after 10,500 BP, Haida Gwaii climate would have been much more Continental in nature.

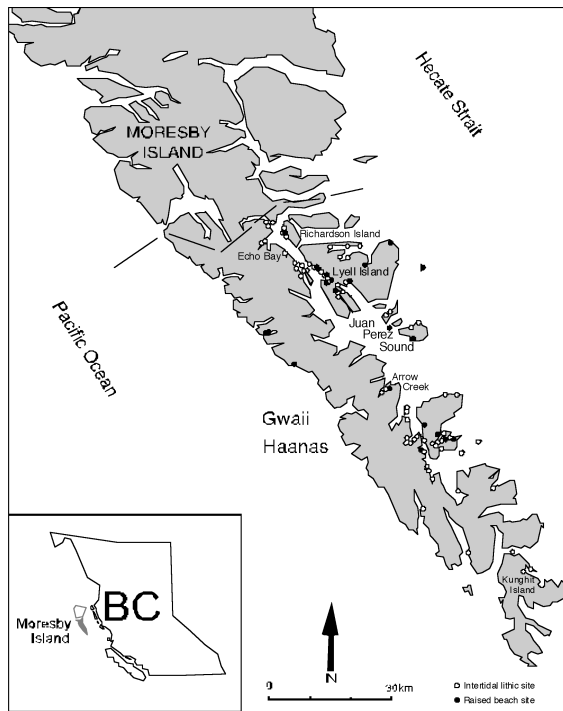
The Gwaii Haanas archaeology inventory program included coastal and raised beach survey, preliminary surface collection, and excavation at early Holocene sites. Coastal survey located both early Holocene "paleo-intertidal" lithic sites and many post 2,000 BP site types. Approximately 100 of the ca. 550 archaeological sites now recorded for the coastal zone have been assigned to the Early Period (pre-5,000 BP). Assignment is based on diagnostic artifacts and assemblages and/or dating of associated deposits.

Raised beach site survey employed digital elevation models (d.e.m.) produced from air photography in selection of high potential landforms along paleo-shorelines. The d.e.m. was used to reconfigure the paleo-shoreline and intertidal zone for the ca. 9,000 and 5,000 BP 15 metre marine transgression. The models are accurate to better than 10 m horizontal and 0.5 m vertical. Detailed contour maps plotted at 1:5000 or larger scale from these databases allow very accurate definition of local topography. In order to maximize site recovery, areas selected for modeling were in proximity to concentrations of paleo-intertidal archaeological sites.

Our methods included surface reconnaissance as well as shovel testing to mitigate problems of visibility and preservation with increasing antiquity. In the field (and some impressive terrain) crews proceeded to d.e.m. mapped target areas and used field generated maps, GPS and digital altimeters (accurate to one metre) to locate suitable landforms and keep within the 14 m to 18 m targeted elevation range. Seventeen archaeological sites were located using this method. Four have been radiocarbon dated. At one site stone tools underlay material dated to 3,700 BP. The other three contain one or more components dating between 6,600 to 8,300 BP. Four sites show evidence of microblade technology.

More detailed assessment has been carried out at six sites: Arrow Creek 1 and 2, Echo Bay,

Gwaii Haanas
Early Period sites.



Lyell Bay 1 and 2, and Richardson Island. The Arrow Creek sites include an early Holocene estuarine deposit near the modern tidal limit (Arrow Creek 1) and a raised beach locality (Arrow Creek 2).

At Arrow Creek 1, artifacts and organic samples were collected from an exposed section and from two 1 m x 2 m excavations on the immediately adjacent two-metre terrace (Fedje et al 1996a). Artifacts were limited to stone tools and were not very abundant ($n < 100$). Several tools had barnacles attached. Dates of 9,100 and 9,200 BP on these barnacles demonstrate occupation at

a time when the ocean was transgressing the present-day tidal limit.

At Arrow Creek 2, a large site of ca. two hectares, tests were excavated on the 15-metre raised beach, producing about 1,000 artifacts, including a large number of microblades and microblade cores. Dating supports occupation from ca. 8,200 to 5,600 BP.

The Echo Bay site appears to be a single component campsite (Fedje et al., 1996b,c). At this site culturally modified sea mammal bone obtained in close association with dense concentrations of stone tools was dated to 9,270 BP. A large number of stone tools including several bifaces, two microblade cores and two microblades were recovered from excavations and systematic surface collections in the intertidal zone. A small faunal assemblage recovered from the excavations includes sea otter, bear and unidentified mammal.

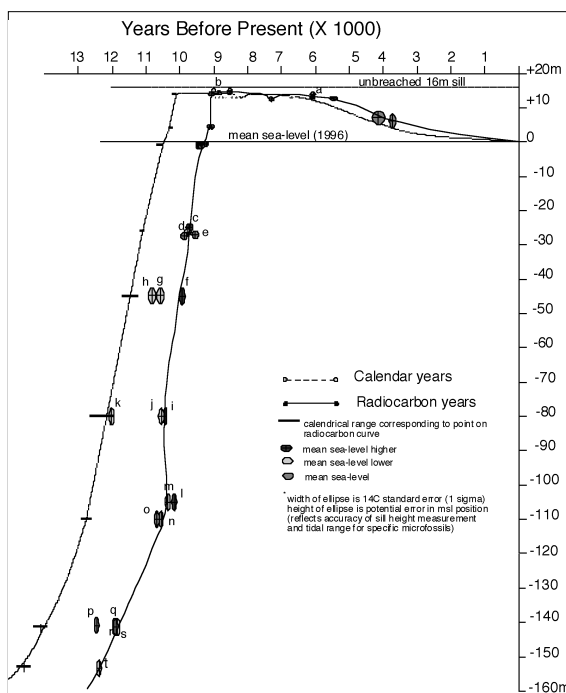
At Lyell Bay, shovel testing and preliminary excavations have been carried out at two sites, each with large numbers of microblades, a few microblade cores and other materials. A date of 7,540 BP was obtained at site 1354T and dates of 6,630 and 8,110 BP for 1355T.

The Richardson Island site includes a deeply stratified campsite on a 15-metre raised beach and a surface scatter (likely largely a secondary deposit) in the modern intertidal zone. The systematic surface collection produced a large lithic assemblage, characterized by large stone tools and microblade cores, most waterworn. Excavation in the intertidal zone produced both waterworn and pristine artifacts, some with shellfish or crustaceans attached which date from 8,500 to 8,800 BP. These data suggest deposition in the subtidal zone during the rapid early Holocene marine transgression (sea level rise). Faunal remains were limited to a whale skull dating to 8,500 BP, a bear tooth and unidentified sea mammal bone.

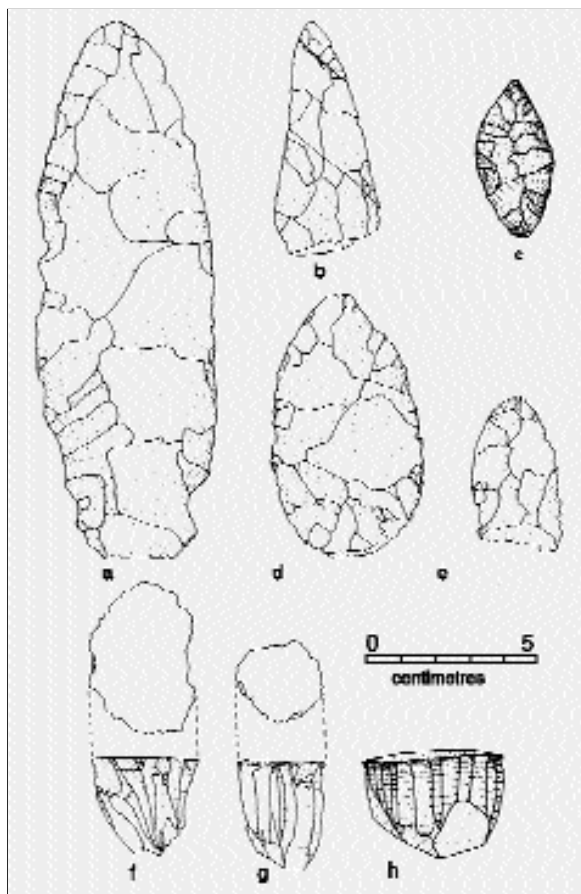
At the 15-metre raised beach component of the site lithic artifacts were abundant. Cultural horizons date from 9,100 BP at the base of the four-metre deep cultural deposits to 8,500 BP near the top. The artifact assemblage ($n > 3000$) is characterized by abundant microblades and occasional bifaces in the upper levels and a large number of bifaces together with an absence of microblades in the lower levels. Organic remains recovered were limited to charcoal and a few grams of calcined bone, including fish, bird and large mammal.

Preliminary work at these sites enables us to make a strong argument for occupation of Haida Gwaii by 9,300 BP, a time when sea level was rising rapidly towards the Holocene maximum. Our understanding lithic technology for the Early Period record in Gwaii Haanas is incomplete as much is based on field observations and formal

Gwaii Haanas rela-
tive sea level curve.



Early Period artifacts from Gwaii Haanas (a,b,c,d,e: bifaces; f,g,h: microblade cores).



analyses are still underway, however, there is tantalizing evidence for a significant change in technology just after ca. 9,000 BP as has been observed elsewhere on the coast).

In concert with the results of a marine geological research, these data suggest the possibility of a much longer record, now drowned, on earlier shorelines. The palynological and geological records show that much of the continental shelf along the Northwest Coast, including the environs of Haida Gwaii was suitable for human occupation by ca. 14,000 BP. The clear survival of archaeological deposits through marine transgression and regression in Gwaii Haanas suggests the possibility of preservation of significantly older coastal occupation sites at depth in western Hecate Strait and terrestrially along the eastern margins of the strait (i.e., the west coast shores of British Columbia) where early post-glacial shorelines are now raised as much as 200 m above the present shore. Elsewhere, Heaton and others have recently discovered a faunal record for nearby Prince of Wales Archipelago of Alaska which spans the last glacial maximum and human remains dating to over 9,700 BP. Knut Fladmark's hypothesis for late Wisconsinan movement of early peoples between Beringia and southern North America via coastal route gains further credence with these data.

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